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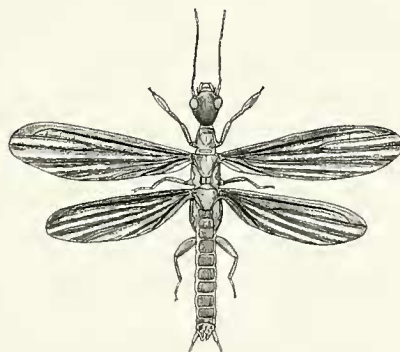
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Contributions to the Biosystematics
of the
Insect Order Embiidina

Part 4
Andesembiidae, a New Andean
Family of Embiidina

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Part 4

Andesembiidae, a New Andean Family of Embiidina

Abstract

Known only from higher altitudes of the Andes, Andesembiidae comprises the new genus *Andesembia* with six new species from Ecuador and Colombia and the new genus *Bryonembia* with one new species from a cloud forest habitat in central Peru.

Acknowledgments

I wish to thank Dr. Evert I. Schlinger for assistance and companionship during my 1954–55 fieldwork in the Andes, as well as David Cavagnaro for collecting cultures in Ecuador during 1964.

Introduction

Explanation of terminalia and wing symbols:

9 = ninth abdominal tergite; 10 L = left hemitergite of abdominal somite 10, 10 LP = its process; 10 R = right hemitergite of 10, 10 RP = its process; MS = medial sclerite of somite 10; MF = medial flap (which may include process of 10 R); EP = epiproct (somite 11); H = hypandrium (ninth sternite), HP = its process; GO = gonopophysis; LPPT and RPPT = left and right paraprocts; LC₁ LC₂ = segments of left cercus. Wing veins: C = costa; RBS = radial blood sinus (RA); RP = posterior radius; MA and MP = branches of media; Cu = cubitus.

Institutional symbols: BMNH – British Museum of Natural History, London; CAS – California Academy of Sciences, San Francisco; IHNB – Instituto de Historia Naturales, Bogota; MUSM – Museo de Historia Natural, Lima, Peru; NMQ – Museo de Ciencias Naturales, Quito; USNM – United States National Museum, Washington.

Paratypes: This designation is limited to topotypic adult males in keeping with my opinion (Ross, 1956, *Systematic Zool.* 5:191–92) that paratypes should as near as possible represent the characters of the holotype and not the general nature of the species, a never-to-be completed objective. Topotypic females are designated parallotypes.

In most cases my type series are from a single culture. Specimens from more distant localities are treated as “other specimens examined.”

Andesembiidae Ross new family

Type genus.—*Andesembia* Ross, new genus, by present designation.

Name basis.—Reference to occurrence in Andes.

Diagnosis.—Males: Small to moderately large (body length 6.5–12 mm), slender; uniformly brown, including antennae and cerci, head darker than body; always alate. Wings usually large relative to body proportions. Head usually disproportionately large. Eyes small. Basal segment of antennae narrow but flared distad; other segments slender, elongate; 15 to 20 segmented. Mandibles often large, irregular in form, always apically dentate. Submentum moderately to strongly sclerotized, margins well defined, sides apically divergent. Wings large; RBS parallel to C, terminated before wing apex; RP relatively well sclerotized; MA sclerotized at base only, continued unforked to wing margin as a line of setae; crossveins absent behind RP. Legs very slender; hind basitarsus very long, slender, without a medial papilla. Terminalia relatively small, weakly sclerotized. Tenth tergite cleft to base; in some species the cleft is broadly membranous, in others the medio-basal area (MS) is very broad, fused to a narrow 10 R. Left hemitergite (10 L) often small, margins weak; its process (10 LP) always simple but at times long and sinuous; right process (10 RP) short. Medial flap (MF) a simple arm connected to base of epiproct sclerite (EP), which is prominent, curved or angled beneath medial flap; its forward extremity variously spiculated from coarse and sparse to minute and dense. Left paraproct (LPPT) a simple, broad sclerite, at times micro-echinulate caudo-mesally, never bearing a process. Right paraproct (RPPT) occasionally as large as left paraproct, however, at times represented only as sclerotic fragments. Hypandrium

process (HP) a simple, rounded or truncate, distally-membranous lobe. Basal segment of left cercus (LC₁) gradually, inwardly expanded distad but never distinctly lobed, but strongly echinulated; distal segment either articulated or fused to basal segment. Basal segment of right cercus not strongly sclerotized, inner-basal portion weak, depressed by contact with the large right paraproct.

Females.—Uniformly brownish. Hind basitarsus without a medial papilla; large setae almost entirely confined to outer side, those of basal half angled distad, those of apical half directed toward plantar side.

Discussion.—This category is proposed for an interesting group of species occurring at high altitudes in the Andes. Were it not for the consistently non-dentate mandibles characterizing all genera of Anisembiidae, one might be tempted to place andesembiid genera in that family. However, the Andean genera are too distinct to place in any known family. Incidentally, andesembiids and anisembiids have no close relatives in the Old World; it is possible, however, that the rather enigmatic, Amazonian genus *Microembia* Ross (Embiidae) might be related.

It is likely that many additional species will be found in the often-disconnected, difficult-to-reach cloud forests and páramos of the Andes. Most of the known species are placed in the highly diversified new genus *Andesembia*. A strikingly-distinct species is assigned to the monotypic new genus *Bryonembia*. The two genera are distinguished, as follows:

Andesembia: Adult males with left cercus two-segmented. Anterior angles of clypeus not produced. Size small, forewing length not exceeding 8 mm. Known only from the Andean highlands of Ecuador and Colombia.

Bryonembia: Adult males with segments of left cercus fused. Anterior angles of clypeus conspicuously lobed. Size large; forewing length exceeding 11 mm. Known only from a cloud forest locality in central Peruvian Andes. Additional species should occur in other Peruvian cloud forests.

Genus *Andesembia* Ross new genus

Type species.—*Andesembia cuencae*, new species, by present designation.

Distribution.—South America: Highlands of Ecuador and Colombia.

Diagnosis.—Males: Rather small; eyes usually abruptly globose, often with pigmented facet-interstices. Antennae with basal segment darker; flagellar segments usually unicolorous to apex, but some species have apical segments gradually pale; segments elongate, setae small. Mandibles usually very large and highly irregular in form; however, in one species (*A. incompta*) they are delicate, apically-tapered, and minutely dentate. Submentum moderately sclerotized; sides usually strongly divergent from base to apex. Hind basitarsus very slender, exceptionally long, without a medial papilla; lateroventral setae in basal half angled distad, the apicals pointed ventrad. All wing veins behind RP represented only by setae and well-defined pigment bands; MA unbranched; cross-veins absent behind RP. Terminalia with left hemitergite (10 L) small; its process (10 LP) long, narrow, parallel-sided, usually curled ventrad. Right hemitergite (10 R) without a prominent process. Medial sclerite (MS) very large in all species (except in *A. calinae*) and fused to 10 R, well separated by a membranous cleavage extended to base of tenth tergite. Medial flap (MF) variable, in some species almost obsolete. Epiproct sclerite (EP) sclerotic, narrow, angled to the right beneath MF and 10 R; its forward apex of two types: one with a few large barbs which are angled to the right, the other with a very dense patch of microspicules. Ventral sclerite as described for the family, but with right paraproct (RPPT) always a large, half-ring plate pressed into the membranous, inner base of right cercus. Left cercus always two-segmented; the basal segment with a sclerotic outer-basal flange (which may be a portion of a cercus-basipodite), inner side of segment gradually expanded and increasingly echinulate distad, but not forming an abrupt lobe. Basal segment of right cercus weakly sclerotized; inner-base deeply depressed by pressure of the paraproct. Apical segments of both cerci normal, equal.

Females.—Without noteworthy generic characters.

Biology.—Scattered, small colonies occur in bark of tree stumps, as well as in draped moss and lichen coverings on rock ledges in páramo zones and damp cloud forests of higher altitudes of the Andes. Usually colonies are very difficult to find because of density of moss. In southern Colombia one spe-

cies, *A. incompta*, was found in deep moss growing on tree fern trunks (Frontispiece), as well as under bark flakes. The type species, *A. cuencae*, is common both in moss on large rocks and beneath bark flakes of small trees.

The highest altitudinal record of any species of the genus is 3700 meters, west of Cuenca in southern Ecuador; the lowest is near Baños, Ecuador, at 1700 meters. Cultures of all species are difficult to maintain for they die within a few weeks after being carried to lower, warmer altitudes. Collectors, therefore, are advised to gather study series of adults in the field. Males in cultures usually matured during February and March.

Component species.—Six new species were collected from the Loja region of Ecuador in the south, northward into mountains west of Cali, Colombia. Because of the diversity of these species and the often-disconnected geographic extent of suitable habitats yet to be searched, the genus should comprise many additional species. Colonies are easily overlooked in tangled, mossy habitats and invariably consist of a single female and her brood. This may explain why, in spite of concentrated search, I have been unable, as yet, to find andesembids in cloud forest and páramo zones in Ecuador north of Baños. The habitats are suitable, species must be present, but finding colonies is like "searching for a needle in a haystack."

Component species, all new, form three groups: the *Cuencae* Group: two species from central Ecuadorian Andes, the *Incompta* Group: one species from extreme southern Colombia, and the *Popayananae* Group: two species from western Colombia.

KEY TO SPECIES OF *ANDESEMBIA*

(Males)

1. Mandibles simple, similar to those of *Oligotoma* and many other species of the order; molar portion not strongly projected mesad. Cranium beneath antennal sockets not strongly or acutely projected laterad. Southern Colombia..... *incompta*
- Mandibles complex, inner faces deeply emarginated; molar portion usually strongly projected mesad. Cranium beneath antennal sockets strongly projected laterad as acute or blunt points. Ecuador and west-central Colombia..... 2

2. Epiproct (EP) with a few coarse, irregular barbs at forward end which are angled meso-caudad. Ecuador..... 3
- EP with a conspicuous, dark, oval patch of very dense microspicules on its forward end. Colombia..... 5
3. Outer basal angles of mandibles extensively and very acutely projected laterad; dorso-basal surface elevated as a narrow, broadly-angled carina. Left tergal process (10 LP) straight.... *banosae*
- Outer basal angles of mandibles less projected, apices blunt; dorso-basal surface without a conspicuous carina. Left process (10 LP) curled leftward and ventrad..... 4
4. 10 LP broadly expanded distad, only 2 barbs on EP, caudal margin of LPPT narrower than HP. Loja region, Ecuador..... *lojae*
- 10 LP narrowly expanded distad, numerous barbs on EP, caudal margin of LPPT as broad as HP..... *cuencae*
5. Anterior angles of submentum narrowly projected forward. Popayan region, Colombia..... *popayananae*
- Anterior angles of submentum broadly rounded. Cali region, Colombia..... *calinae*

CUENCAE GROUP *Andesembia cuencae* Ross

new species

(FIGURE 1)

Holotype.—Male, on slide, CAS. Data.—Ecuador: Lago Zhurucuchu, 3700 m elev. (est.), 11 km W of Cuenca, Azuay, 16-II-1955 (E. S. Ross).

Description.—Appearance: Small (body length 7.5 mm); wings relatively large, extended well beyond apices of cerci; generally golden brown with creamy white prothoracic membranes; cranium mahogany brown; apical antennal segments only slightly paler than others. Color details (in alcohol): cranium dark mahogany brown except for paler vertex pattern; eyes gray-black; antennal scape mahogany brown, other segments, except three tan apicals, medium brown (15 segments); preclypeal membrane creamy white; mandibles dark amber with piceous margins, other mouthparts medium brown with creamy white membranes; submentum glossy, piceous. Body sclerites and legs varied shades of medium brown with creamy white membranes;

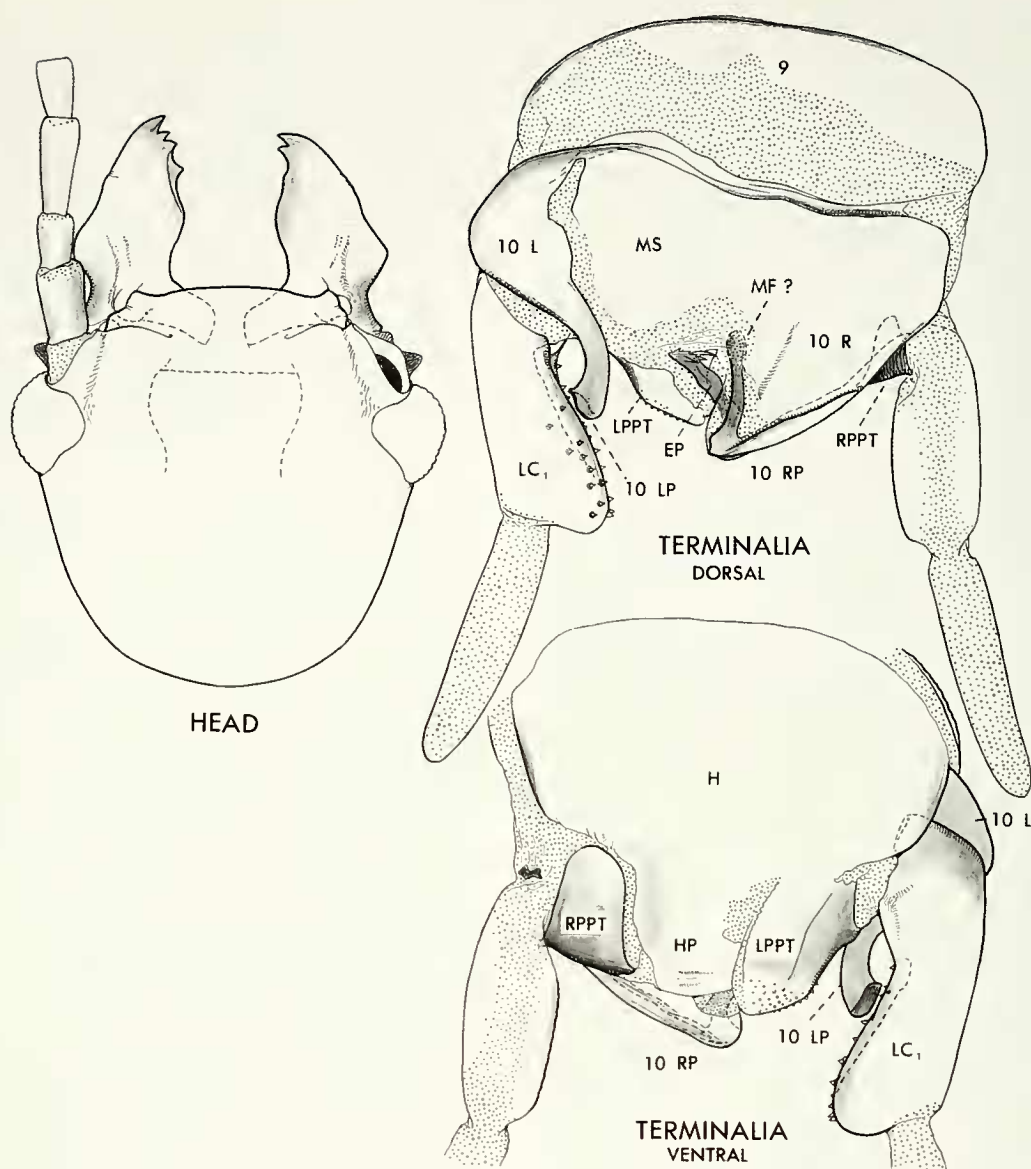


FIGURE 1. Important characters of holotype of *Andesembia cuencae* Ross. Type locality: Ecuador, Lago Zhurucuchu, Prov. Azuay (11 km W of Cuenca), est. 3700 m elev.

terminalia medium mahogany brown with piceous margins, distal segments of cerci almost creamy white in contrast to medium brown basal segments. Dimensions (on slide): Body length 7.5 mm; forewing length 5.5 mm, breadth 1.4 mm.

Important integumental characters.—As figured. Noteworthy is the shape of the mandibles without acutely pointed outer angles, or a prominent dorso-basal carina; submentum without forward projections of the apical angles; cranial projections beneath antennal sockets short, apically rounded; left tergal

process (10 LP) narrow, parallel-sided, not strongly flared distad, curled ventrad; medial sclerite (MF) broad, inner and caudal margins well defined; right tergal process (10 RP) with a subapical membranous “chevron” between medial flap (MF) and its outer margin; inner side of basal segment of left cercus (LC_1) gradually expanded but not definitely lobed, entire surface echinulate.

Paratypes.—A series of topotypic males deposited in CAS, USNM, BMNH and NMQ.

Allotype.—Female (in alcohol) with holotype data and disposition.

Description.—Color details: Almost all sclerites are dark chocolate brown; cranium, pronotum and mesonotum darkest; first acrotergite pale yellow. All membranes creamy white. Basal antennal segment medium brown, all flagellar segments (18 in all) light brown; apicals concolorous with basals. Cerci yellow tan with whitish membranes. Eighth abdominal sternite evenly sclerotized except for two narrow, pale excisions along caudal margin; color dark mahogany brown. Ninth sternite also dark mahogany brown; transversely narrow and broadly, shallowly emarginated along anterior margin. Accessory gland area membranous. Paraprocts light brown basally blending to creamy white caudally. Body length: 8.5 mm.

Parallotypes —Series of topotypic females with paratypic disposition.

Discussion.—The type cultures were first collected by me (1955) and later by David Cavagnaro (1964), in dense, low cloud forest near a small lake. Colonies were common under bark flakes of trees and stumps. More recently (1993) I found colonies common beneath lichens and in moss tufts on large volcanic boulders in open páramo of Parque Nacional Cajas, 3550 m elev., about 20 km NW of Cuenca. Because males matured during January, February, June, and July, it is likely that maturity isn't seasonally limited.

David Cavagnaro also collected a culture of a very closely-related new species, far to the south of Cuenca in second-growth páramo scrub at 3000 m elev. on the east slope of the misty pass between Loja and Catamayo. Colonies were in crevices on the bank of a deeply eroded Indian trail. Males matured during July and August, 1964. The culture did not long survive under laboratory conditions. These specimens are treated, at least tentatively, as a distinct species, described below.

Andesembia lojæ Ross

new species

(FIGURE 2)

Holotype.—Male, on slide, CAS. Data.—Ecuador: Pass west of Loja, at 3000 m elev. on Loja-Catamayo road (D. Q. Cavagnaro).

Description.—Appearance, size and coloration

as described for *A. cuencae*. Integumental characters, as figured, showing minor distinctions, as follows: Projection beneath antennal socket narrowly acute, slightly slanted caudad (blunt, projected straight laterad in *A. cuencae*). Left process of tenth tergite (10 LP) broadly flared (narrowly flared in *A. cuencae*). Subapical surface of 10 RP solid (with a chevron-shaped, membranous area in *A. cuencae*). Epiproct sclerite (EP) with only two barbs (several in *A. cuencae*). Caudal portion of LPPT narrower than HP (broad in *A. cuencae*, as broad as HP).

Discussion.— I was tempted to regard the Loja population as a subspecies of *A. cuencae*; however, with many intervening topographic barriers and distance, the two populations are significantly separated. My attempt to collect specimens in intermediate localities failed—also failed in Podocarpus National Park, a more southernly location. Although difficult to find, colonies of *Andesembia* almost certainly occur in these regions.

Andesembia banosae Ross

new species

(FIGURE 3)

Holotype.—Male, on slide, CAS. Data.—Ecuador: 3 mi E of Baños, 1700 m elev. Crevice in volcanic cliff, 11-II-55 (E. S. Ross).

Description.—Appearance: Small (body length 6.5 mm); wings rather small, short; body generally dark brown, prothorax contrastingly pale. Color details (in alcohol): Cranium piceous dorsally and ventrally, lacking pattern. Basal antennal segment concolorous with head, other segments medium brown except the apical (15th), which is tan. Mandibles dark brown basally, blending distad to pale amber, teeth reddish amber. Palpi medium brown, submentum piceous. Prothorax straw yellow with medium brown sclerites; forelegs dark brown except for medium brown coxae and trochanters. Pterothorax dark brown with slight bluish luster, legs similar but somewhat paler. Abdomen reddish tan with light brown sclerites; ninth and tenth somites dark brown with paler cerci. Dimensions (on slide): Body length 6.5 mm; forewing length 4.9 mm, breadth 1.2 mm.

Important anatomical characters.—As figured. Noteworthy are the extensively projected, acute, outer angles of the mandibles, as well as the longitudinal broadly angulate, dorsal carina of the

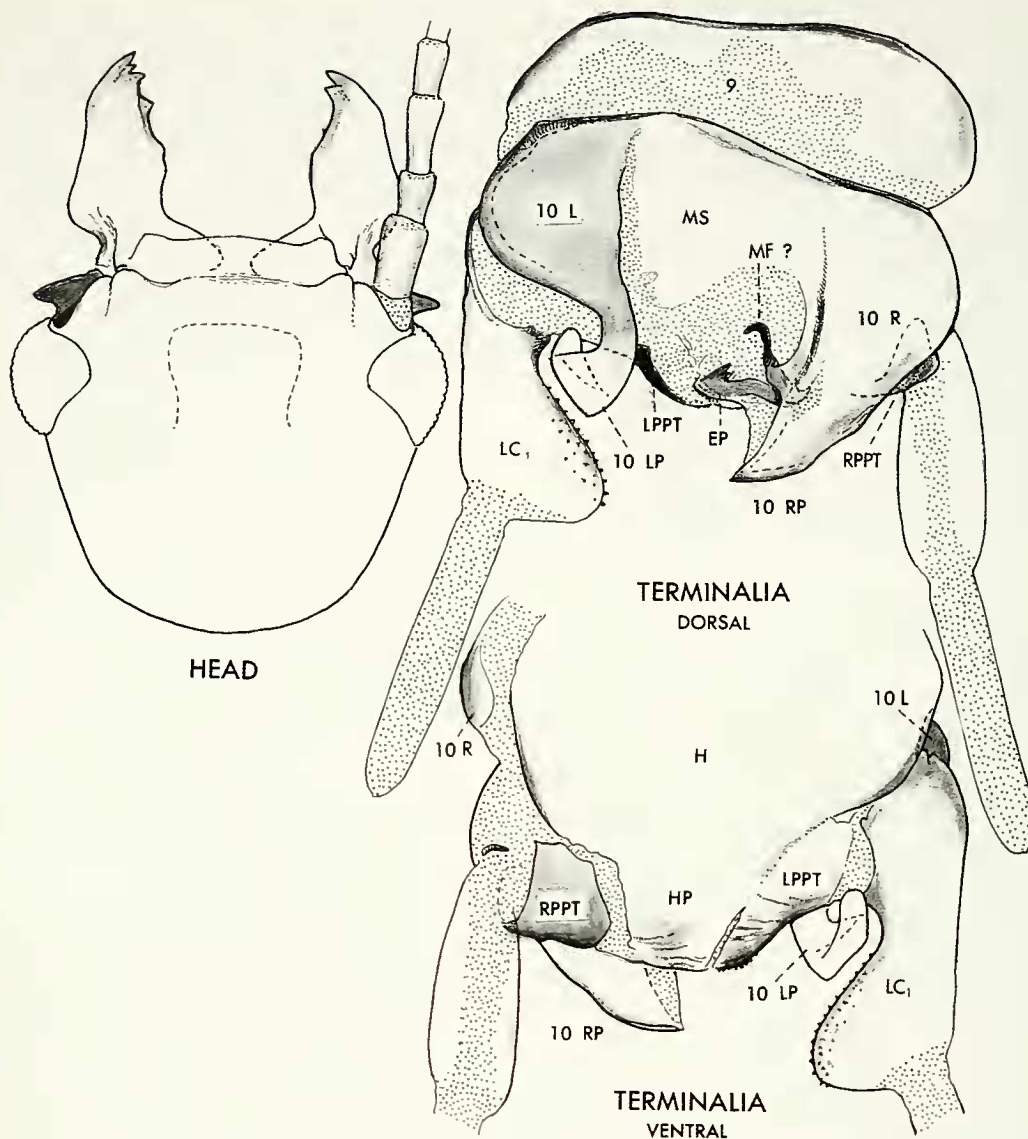


FIGURE 2. Important characters of *Andesembia lojæ* n. sp. Type locality: Ecuador, Loja-Catamayo road, crest of pass at about 3000 m elev., Prov. Loja.

mandible's basal third; the distally swollen antennal scape; the straight, horizontal (not flared or downwardly curved) left tergal process (10 LP); the less coarsely-spiculated, forward end of the epiproct (EP); the reduced left paraproct (LPPT); and the short, globose basal segment (LC₁) of the left cercus which is rounded on its inner face and coarsely echinulate on its entire length.

Paratypes —A small, topotypic series collected by me (1955) and David Cavagnaro (1964), deposited in CAS, USNM, and NMQ.

Discussion.—Colonies, consisting of one parent female and brood, were rare and inconspicuous in crevices in vertical, volcanic cliffs. They weren't found in silty trail banks, as was a small new species of *Oligembia*, nor were they found in moss or under bark flakes, as was the case with more abundant *A. cuencae*. David Cavagnaro's small topotypic culture produced five adult males during July, 1964, but the culture soon died.

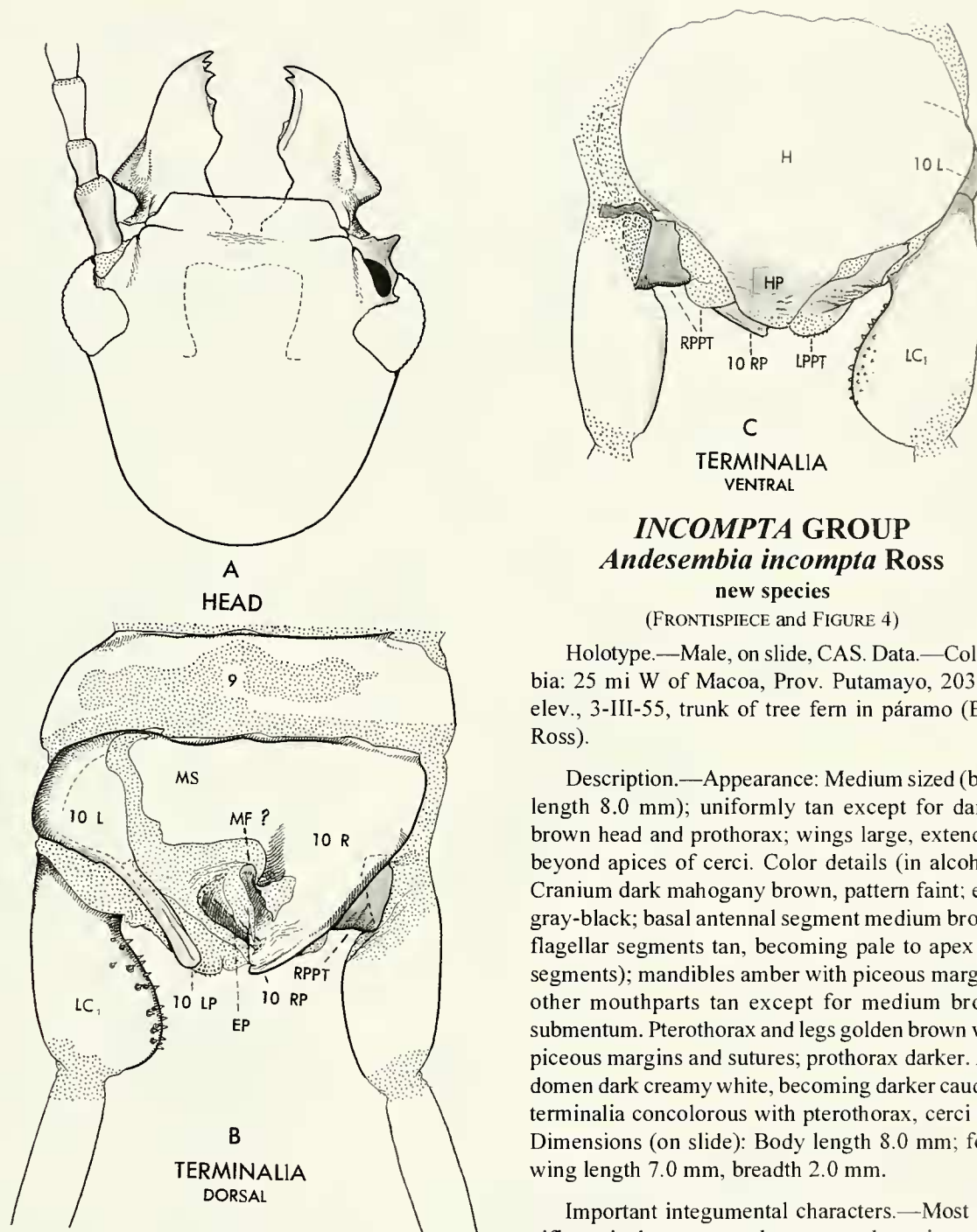


FIGURE 3 (A-C. Important characters of holotype of *Andesembia banosae* Ross. Type locality: Ecuador, 3 mi E of Baños, Prov. Tungurahua, 1700 m elev.

INCOMPTA GROUP
***Andesembia incompta* Ross**
 new species

(FRONTISPIECE and FIGURE 4)

Holotype.—Male, on slide, CAS. Data.—Colombia: 25 mi W of Macoa, Prov. Putamayo, 2030 m elev., 3-III-55, trunk of tree fern in páramo (E. S. Ross).

Description.—Appearance: Medium sized (body length 8.0 mm); uniformly tan except for darker brown head and prothorax; wings large, extending beyond apices of cerci. Color details (in alcohol): Cranium dark mahogany brown, pattern faint; eyes gray-black; basal antennal segment medium brown, flagellar segments tan, becoming pale to apex (18 segments); mandibles amber with piceous margins, other mouthparts tan except for medium brown submentum. Pterothorax and legs golden brown with piceous margins and sutures; prothorax darker. Abdomen dark creamy white, becoming darker caudad; terminalia concolorous with pterothorax, cerci tan. Dimensions (on slide): Body length 8.0 mm; forewing length 7.0 mm, breadth 2.0 mm.

Important integumental characters.—Most significant is the narrow, elongate-oval cranium with greatly reduced projections beneath the antennal sockets; the small, simple mandibles with fine apical dentation; the terminalia are basically similar to those of species of the *Cuencae* Group, differing primarily in reduced spiculation of the epiproct.

Paratypes.—Males from 2000–2500 meter zone between Santiago and Macoa, Prov. Putamayo,

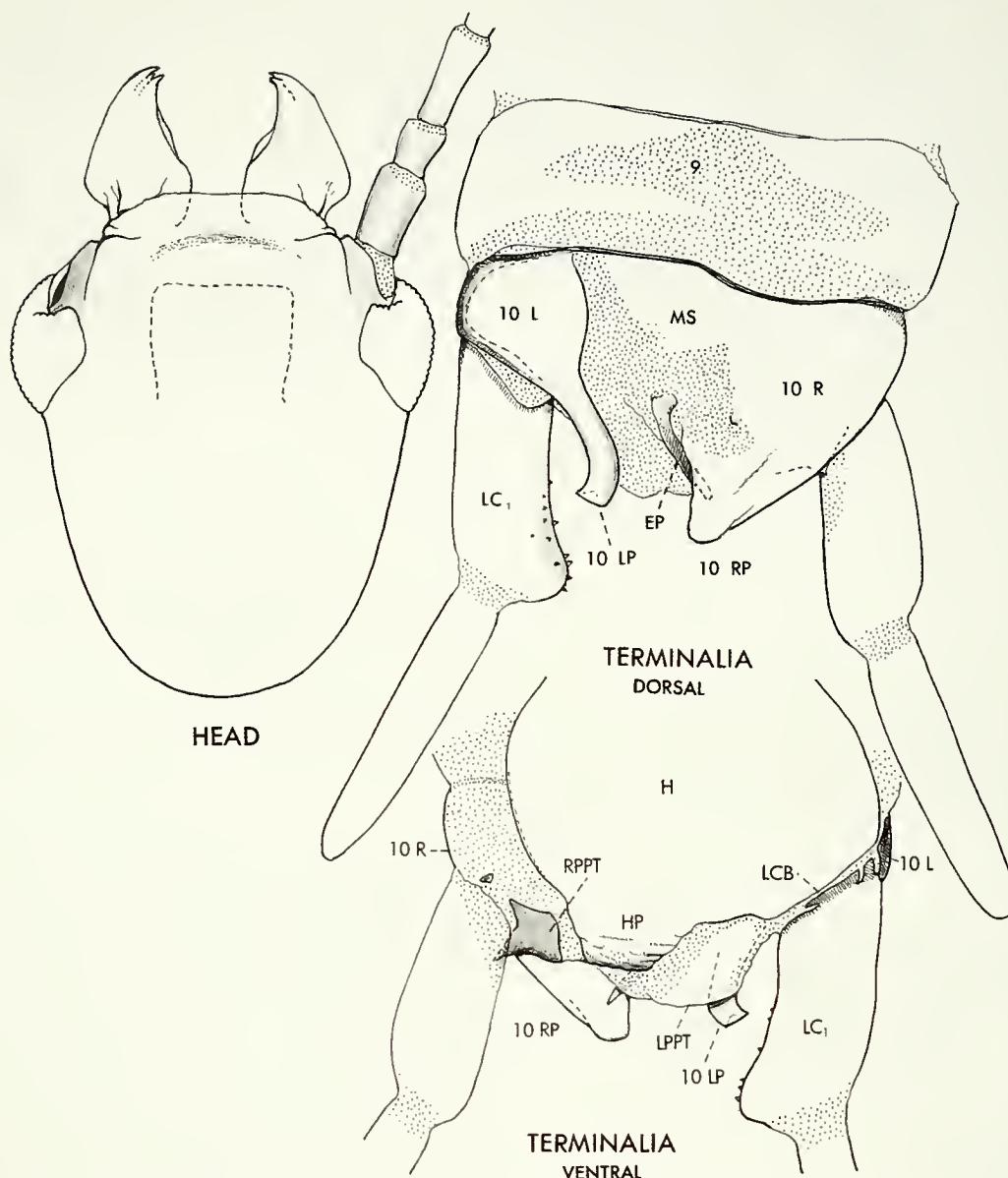


FIGURE 4. Important characters of holotype of *Andesembia incompta* Ross. Type locality: Colombia, 25 mi W of Macoa, Prov. Putamayo, 2030 m elev.

southern Colombia. Deposited in CAS, USNM, and ICNB.

Discussion.—It was almost disappointing to discover this species with its ordinary head and mandibles in a family otherwise characterized by unusual head and mandible features. These simple characters alone are sufficient for immediate recognition of the species.

The type series was collected in a few places between Macoa and Santiago, Prov. Putamayo, southern Colombia, between 2000 and 2500 m elevation. Habitats in the páramo zone include tree fern epiphytes (Frontispiece) and mossy stumps in cleared pasture.

POPAYANAE GROUP
***Andesembia popayanae* Ross**

new species

(FIGURE 5)

Holotype —Male, on slide, CAS. Data.—Colombia: 11 mi N of Popayan, Prov. Cauca, 1830 m elev., 5-III-55 (E. S. Ross).

Description.—Appearance: Rather small (body length 7.2 mm), wings large; medium brown throughout with head piceous, antennal apices whitish. Color details (in alcohol): Cranium piceous throughout, without pattern, ventral surface paler brown. Eyes subcutaneously gray-black. Basal antennal segment concolorous with cranium, segment

2 paler; segment 3 to apex blending from medium brown to creamy white. Mandibles piceous basally, blending to dark amber distad, dental margins reddish amber; palpi gray-tan, lacinia yellowish, submentum piceous. Thorax and legs varied shades of medium brown; prothorax darker; wings medium brown. Abdomen paler than thorax; terminalia scarcely darker, margins of sclerites and medial sclerite (MS) piceous; basal segments of cerci light brown, distals lighter. Dimensions (on slide): Body length 7.2 mm; forewing length 6.0 mm, breadth 1.7 mm.

Important integumental characters.—As figured; noteworthy are irregularly indented, inner margins of the mandibles; large, broad submentum with di-

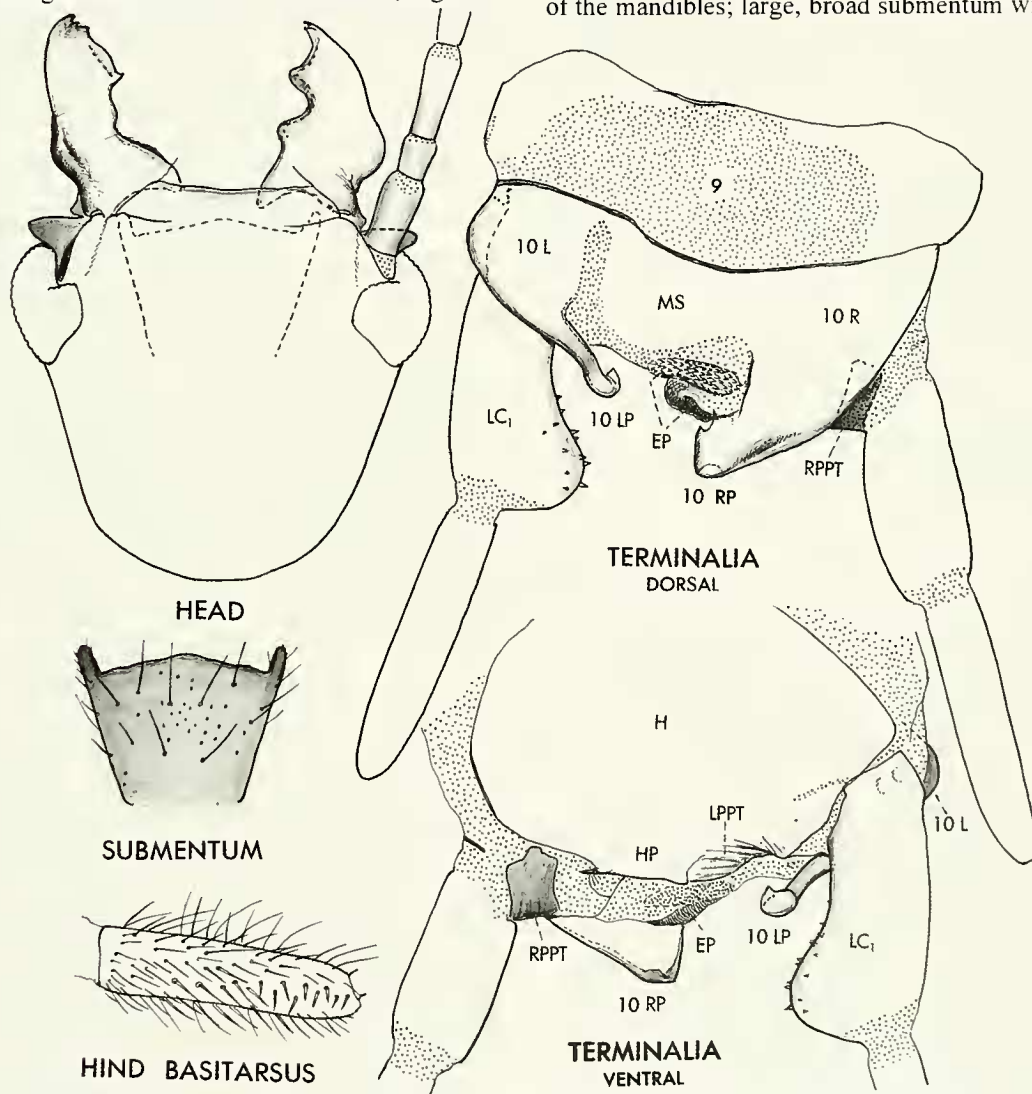


FIGURE 5. Important characters of holotype of *Andesembia popayanae* Ross. Type locality: Colombia, 11 mi N of Popayan, Prov. Cauca, 1830 m elev.

vergent sides terminating with pronounced projections of outer apical corners; left mandible with much higher outer-basal ridge than on the right one; the small, narrow, downwardly-twisted, left tergal process (10 LP); the dark, densely-microspiculate, forward patch of the epiproct; the strigose left paraproct (LPPT); and the gradually distally-expanded, basal segment of the left cercus which bears scattered echinulations.

Discussion.—This species is readily recognized by the very peculiar mandibles and submentum of its males. Only the holotype and an accompanying adult female were collected on a mossy tree base projecting from a road bank. The significance of the species wasn't realized until months later in my home laboratory. Otherwise, the short road stop would have been extended in the hope of obtaining a productive culture.

The conspicuous dense patch of the epiproct's microspiculation relates *A. popayanae* to *A. calinae*, but great differences in the mandibles, submentum and other characters (as figured) readily distinguish the two species.

***Andesembia calinae* Ross**

new species

(FIGURE 6)

Holotype.—Male, on slide, CAS. Data.—Colombia: 13 mi W of Cali, Prov. Valle, 1820 m elev., 20-III-55 (E. S. Ross).

Name basis.—Reference to type locality near Cali.

Description.—Appearance: Medium sized (body length 9.0 mm), wings large; medium brown throughout, head piceous. Color details (in alcohol): Cranium piceous without trace of pattern, ventral surface paler brown. Basal segment of antenna dark brown, second lighter, 3–7 smoke tan, 8–10 gray-white, distal segments lost. Mandibles blending from dark brown basally to amber subapically, dental margins reddish amber; palpi medium brown; submentum piceous, as dark, or darker, than cranium. Entire thorax and legs varied shades of medium brown, prothorax somewhat darker; mid- and hind tarsi pale tan. Abdomen light brown with tan membranes; terminalia, including basal cercus segments, medium brown, apical segments paler. Dimensions (on slide): Body length 9.0 mm; forewing length 6.6 mm, breadth 1.0 mm.

Important integumental characters.—As figured; mandibles large, irregular in form, apices narrowly tapered, inner bases strongly projected mesad; submentum heavily sclerotized, but small, sides divergent forward, apical corners rounded. Left tergal process (10 LP) moderately large, parallel sided, abruptly curved leftward, terminated as a sharp point; right process (10 RP) very short. Epiproct (EP) with a very dense, dark mass of microspiculations. Basal segment of left cercus gradually swollen distad but not forming a lobe, echinulations confined to distal inner surface.

Discussion.—The type locality is on the road between Cali and Buenaventura. A single colony was found under bark of a damp, rotting stump in recently cleared montane forest. The galleries deeply penetrated the soft fibrous bark. Although numerous nymphs were cultured, only the holotype and nine females matured, all others died.

Genus *Bryonembia* Ross

new genus

Type species.—*Bryonembia amplialata* Ross, new species, by present designation.

Name basis.—Greek *bryon*, moss, in reference to the mossy habitat.

Distribution.—Peru: Cloud forest zone, Carpish mountains (east of Huánuco).

Diagnosis.—Males: Very large, slender-bodied with disproportionately-large wings but with abdomen and terminalia unusually small. Uniformly tan with dark head, all appendages concolorous with body. Cranium as in *Andesembia*, but with clypeus medially depressed and with each anterior angle greatly produced as a blunt lobe. Antennae with flagellar segments very elongate. Mandibles broad-based and angled outward, then abruptly angled mesad at 90°; apical dentation normal. Submentum narrower at base than at apex. Hind basitarsi as in *Andesembia*, but with latero-ventral setae longer. Wings also similar but proportionately larger. Terminalia with basic structure of *Andesembia*, differing as follows: left tergal process (10 LP) shorter and broader; right paraproct (RPPT) (or perhaps a cercus-basipodite) smaller, fragmentary; left paraproct (LPPT) without trace of apical echinulations; distal segment of left cercus broadly fused to basal segment, line of former articulation marked by membrane.

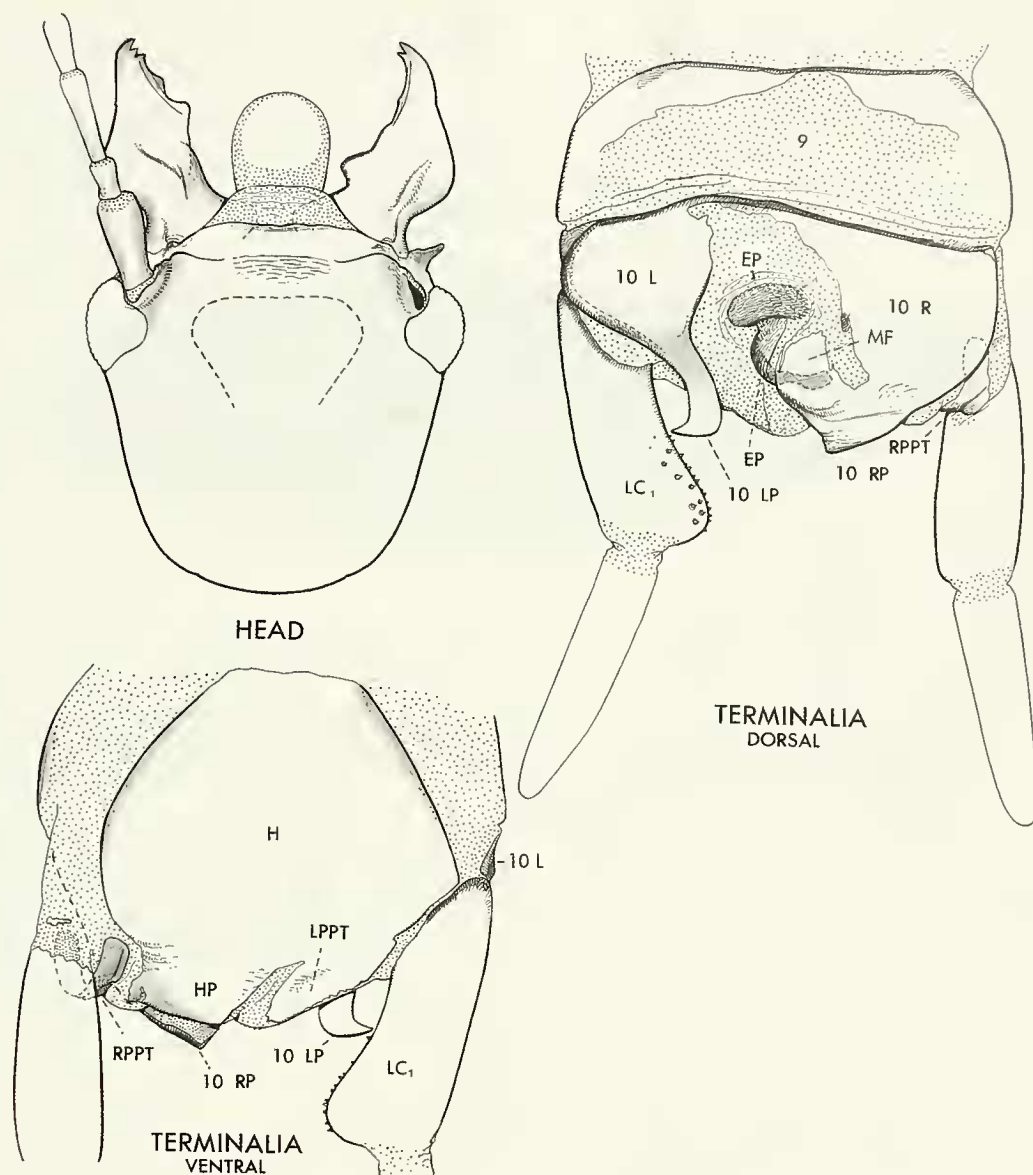


FIGURE 6. Important characters of holotype of *Andesembia calinae* Ross. Type locality: Colombia, 13 mi W of Cali, Prov. Valle, 1820 m elev.

Females.—Uniformly brown throughout, apparently without generic level characters.

Biology.—Occurs in cloud forests which receive very heavy rain or mist. The type species is most readily collected on rocky road banks where the thin silk galleries radiate from crevices. The species also occurs in hanging moss on trees and vines, as well as in trunks of tree ferns. The zone is about 3000 m elevation. Adults of both sexes were collected in the field during September and May and thus maturity is not limited to one period each year.

Unfortunately, since my visit forty-eight years ago, the habitat has probably been destroyed, or seriously damaged, by steep, hillside farming and tree-cutting for fuel and charcoal production.

The silk galleries are very thin-walled and extend unbranched for considerable distances. Only one species is known. The species does not survive long in cultures and only late stage nymphs live long enough to mature.

***Bryonembia amplialata* Ross**

new species

(FIGURE 7)

Holotype.—Male, on slide, CAS. Data.—Peru: 2 mi (by road) E of crest of Carpish mountains, Huánuco, about 3000 m elev., 17-IX-1954 (E. S. Ross).

Name basis.—Reference to exceptionally large wings.

Description.—As described in the generic description, and illustrated. Dimensions (on slide): Body length 12.5 mm; forewing length 11.5 mm, breadth 2.75 mm.

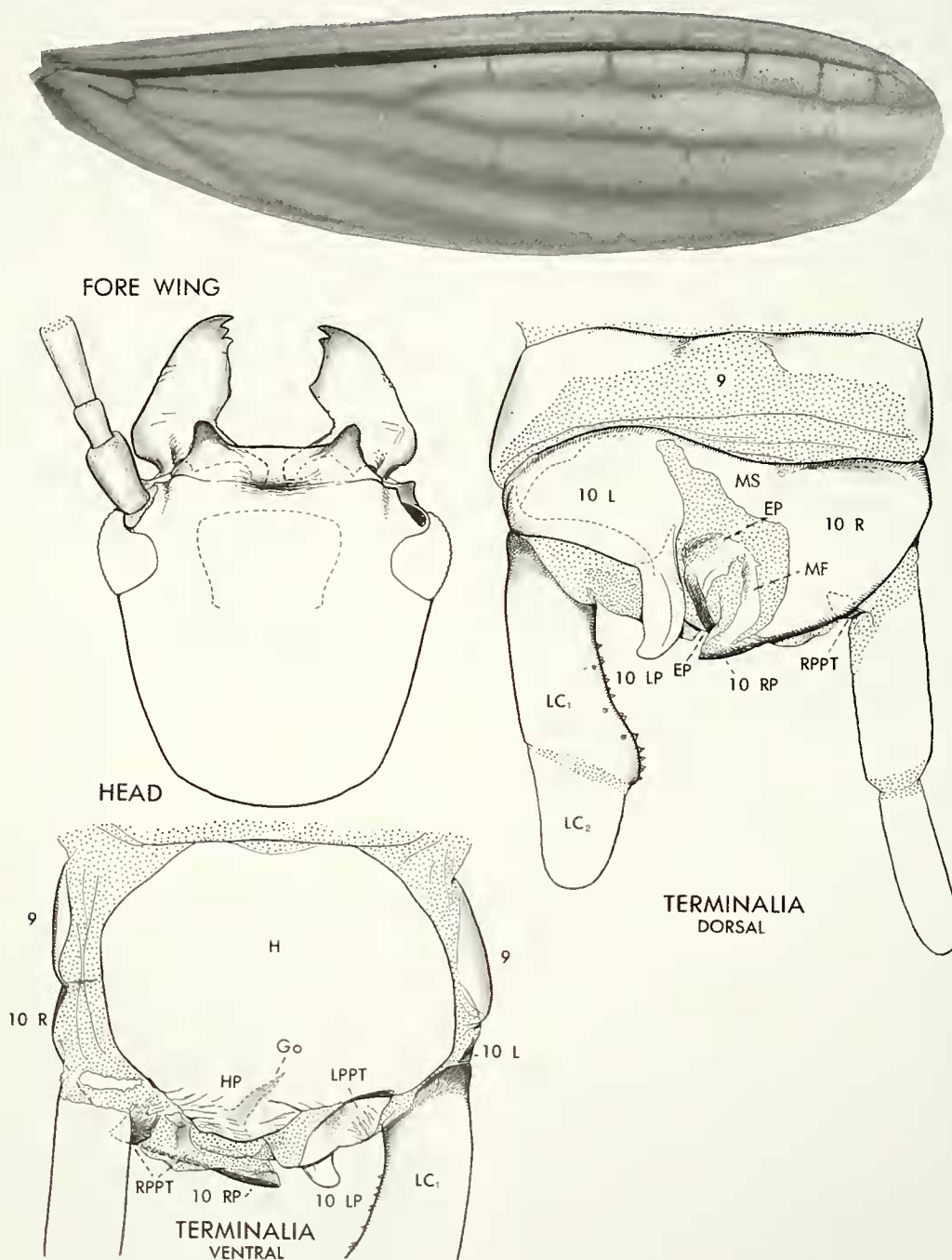


FIGURE 7. Important characters of holotype of *Bryonembia amplialata* Ross. Type locality: Peru, 2 mi E of crest of Carpish Mtns, Prov. Huánuco, about 3000 m elev.

Paratypes.—Six topotypic males deposited in CAS, USNM, and MUSM.

Allotype.—Female (in alcohol) with holotype data and disposition.

Description.—Appearance: All sclerotized portions of body and legs dark chestnut brown. Cranium rather elongate, basically light chestnut brown but clouded in a definite vertex pattern with darker brown. Antennal scape pale amber, tinged with brown; flagellar segments (17 in all) pale brown, distal segment yellowish. Acrotergites concolorous with nota. Eighth abdominal sternite with a narrow dark brown crescent on each side, otherwise extensively pale tan. Ninth sternite dark brown with a

membranous, obtuse emargination in anterior margin. Paraprocts tan. Basal segment of cercus medium brown, distals pale tan. Body length 12.5 mm.

Parallotypes.—Four topotypic females in CAS.

Discussion.—It is tantalizing to consider the occurrence of many other remarkable congeners in scattered, often disconnected cloud forests of the Peruvian and Bolivian Andes.

It should be noted that a very active, elongate species of Onychophora occurs in the damp, mossy roadbank habitat of *Bryonembia* and might be one of its predators.